NJIT New Jersey's Science & Technology University

NEWARK COLLEGE OF ENGINEERING

Transportation Research
New Jersey Institute of Technology

To: Camille Crichton-Sumners

Title: Quarterly Reports

Time Period: First Quarter, 2009

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	**Implementation of Maintenance Decision Support System in New Jersey**
RFP Number: NJDOT 2007-09	**NJDOT Research Project Manager:** Robert Sasor
Task Order Number/Study Number: TO-70	**Principal Investigator:** Chien, Steven I-Jy
Project Starting Date: 7/23/2007 **Original Project Ending Date:** 7/31/2009 **Modified Completion Date:**	**Period Starting Date:** 1/01/2009 **Period Ending Date:** 3/31/2009

Task	% of Total Budget	Total Budget	% of Task this quarter	Cost this quarter	% of Task to date	Cost To Date
Conduct a literature search of state-of-practice	2.63	$9,000	0	$0	100	$9,000
Conduct a Comprehensive and Focused Literature Review.	5.26	$18,000	0	$0	100	$18,000
Study the prototype of MDSS	15.79	$54,000	16	$8,640	100	$54,000
Technology Transfer	13.16	$45,000	25	$11,250	85	$38,250
Identify Studied Region and Investigate Existing Data Sources	15.79	$54,000	35	$18,900	85	$45,900
Study MDSS Forms for Database Development	7.02	$24,000	50	$12,000	80	$19,200
Data Collection	11.70	$40,000	60	$24,000	80	$32,000
Develop NJ-MDSS	17.54	$60,000	60	$36,000	80	$48,000
Presentation, Implementation, and Training	2.34	$8,000	50	$4,000	50	$4,000
Final Repor	8.77	$30,000	50	$15,000	50	$15,000
TOTAL	100 %	$342,000		$129,790		$283,350

Project Objectives:

The objectives to developing a New Jersey specific MDSS database are to:

- Utilize and maximize the existing roadway, surface and weather forecasting data resources;
- Identify weaknesses and bolster or improve the accuracy and speed (real-time) of information gathering and dissemination;
- Combine data to create an open, integrated and understandable presentation of current environmental, atmospheric and roadway conditions;
- Process and query data to generate diagnostic and prognostic GIS mapping of road conditions along identified corridors;
- Predict future changes in roadway conditions to aid in resource management;
- Notify NJDOT of up-to-the-minute conditions and suggest optimal maintenance treatments for future changes in conditions;

- Interface with neighboring state MDSS (optional);
- Evaluate reliability of predictions and effectiveness of applied treatments for specific road or weather conditions; and
- Provide year-end reports to include equipment, manpower, and resource usage, etc.

Project Abstract:

Managing winter maintenance activities is a fairly complex endeavor. Maintenance supervisors must know the regulations about chemical applications and environmental impacts and be able to analyze and make sense of multiple and often contradictory weather forecasts. In addition, many maintenance supervisors also are faced with tight budgets. This is further complicated by the need to obtain salting and plowing services from outside contractors. All of these factors challenge public agencies to meet the traveling public's high expectation that roads be kept free of snow and ice. Therefore, it is desirable that today's maintenance supervisors have the ability to efficiently handle multiple tasks and process high volumes of information in adverse winter weather conditions.

The research team is proposing a pilot study in developing and implementing NJ-MDSS for NJDOT, within which state-of-the-art weather forecasting and data fusion techniques will merge with computerized winter road maintenance rules of practice, such that consolidated weather forecasting, specific current and future roadway and bridge deck condition information, and treatments and timeline applications can be well taken. Optimally, the proposed NJ-MDSS will allow NJDOT to make informed decisions based on accurate information, mainly collected by state-funded surface transportation related sensors (e.g., Clarus (RWIS)), which will ultimately lead to a higher level of service and reduced weather-related congestion delay and accidents, as well as reduced redundancy and environmental/ecological impacts; more efficient use of manpower, contractor services, fleet and asset management; and increased accountability resulting in more prudent and efficient spending. The outcome of the proposed NJ-MDSS will be a set of guidelines aimed at maintenance supervisors that provides a precise forecast of surface conditions and treatment recommendations customized for selected roadways in New Jersey. With the developing weather conditions and the availability of chemicals and manpower/vehicles NJ-MDSS would issue tickets with location information (road and mile post) for winter treatment. The long-term objective would be to fully automate the system after several trials over a couple of years.

1.Progress this quarter by task:

- Continuously developing/testing MDSS v5
- Attended TRB Annual Meeting and presented papers

- Updated configuration files with most recent traffic volume data and actual pavement information provided by NJDOT
- Completed mechanisms that address missing observation and time lag problems in observation data
- Debuged NJ-MDSS road forecast and bridge frost modules since Feb. 23, 2009
- Reviewed sample weather data from DTN/Meteorlogix
- Set up a test server for implementing and testing configurations for weather data from DTN/Meteorlogix

2. Proposed activities for next quarter by task:

- Debug MDSS road treatment module
- Research methods to regenerate recommended treatment for stored weather data (weather data were collected on our server since Nov. 18, 2008)
- Open NJ-MDSS server for access outside of NJIT
- Implement and test configurations for weather data from DTN/Meteorlogix
- Test NJ-MDSS fed by weather data from DTN/Meteorlogix
- Use actual treatment data collected at Columbia Yard to fine tune parameters in NJ-MDSS, so it will generate recommendations that are close to current NJDOT winter maintenance practices
- prepare project report

3. List of deliverables provided in this quarter by task (product date):

none yet

4. Progress on implementation and training activities:

none yet

5. Problems/proposed solutions:

none

6. Budget summary:

Total Project Budget	$342,000
Modified Contract Amount	$0.00
Funding Award to Date	$342,000
Total Project Expenditure to date	$283,350
% of Total Project Budget Expended	82.85 %
% of Total Project Completed	82.85 %

NJDOT Research Project Manager Concurrence: _____ **Date:** _____

NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	**Variability of Travel Times on New Jersey Highways**
RFP Number: 2005-14	**NJDOT Research Project Manager:** Robert Sasor, NJDOT
Task Order Number/Study Number: TO-67	**Principal Investigator:** Chien, Steven I-Jy
Project Starting Date: 12/01/2006 **Original Project Ending Date:** 05/31/2008 **Modified Completion Date:** 2/28/2009	**Period Starting Date:** 1/01/2009 **Period Ending Date:** 3/31/2009

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	5	0	100	5
Comprehensive and Focused Literature Review	5	0	100	5
Identify Suitable Technologies and Methodologies	5	0	100	5
Data Collection	40	0	100	40
Travel Time Estimation	15	10	100	15
Average Daily Non-recurrent Delay Estimation	15	50	100	15
Identification of Congested Highways with High Variation	10	50	100	10
Final Report	5	50	90	4.5
TOTAL	100 %			99.5 %

Project Objectives:

(1)To measure travel times for repetitive day-to-day trips in the AM peak period on 15-20 congested New Jersey highways.
(2)To study the variability of travel times on these highways and determine good estimates of non-recurring delay from incidents and other sources.
(3)To identify which of these highways have problems with high variability in day-to-day travel times to work.

Project Abstract:

One of the most significant concerns for drivers going to work is the variability and reliability of their travel time. Travel time loss from unexpected delays results in lost time from work. Frequent but irregular delays make it difficult for drivers to plan when to leave for work. The reliability of travel times is being used as a new performance measure to evaluate traffic congestion and measure non-recurring delay. Reliability of travel times can be measured by the statistical variation and by the percent of time above a given threshold of what is considered normal delay time. Average daily non-recurring delay can be estimated by multiplying VMT from the

NJCMS by the average time above the threshold time for the sections traveled. The variability of travel times probably has a greater effect on travel than the average or typical travel time.

The variability of travel times needs to be studied for some of New Jersey's congested highways to obtain better estimates of non-recurring delay from incidents and other sources, and to identify problem highways with high variability in day-to-day travel times to work. The findings would guide NJDOT staff in making highway improvements and implementing strategies to reduce congestion and incident delay along these problem roads.

1.Progress this quarter by task:

- Investigate incident data and finalize the project results

2. Proposed activities for next quarter by task:

- To finalize the project report based on review comments

3. List of deliverables provided in this quarter by task (product date):

none yet

4. Progress on implementation and training activities:

none yet

5. Problems/proposed solutions:

none yet

6. Budget summary:

Total Project Budget	$299,076.00
Modified Contract Amount	
Total Project Expenditure to date	$258,313.00
% of Total Project Budget Expended	86.37%

NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	**Development of Simulation and Prototype Data Warehouse Models for Evaluating ITS Projects**
RFP Number: Special Project 2003	**NJDOT Research Project Manager:** Camille Crichton-Sumners
Task Order Number/Study Number: TO-58	**Principal Investigator:** Chien, Steven I-Jy
Project Starting Date: 01/01/2005 **Original Project Ending Date:** 12/31/2005 **Modified Completion Date:** 09/30/2008	**Period Starting Date:** 1/01/2009 **Period Ending Date:** 3/31/2009

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Task 1: Detailed Literature Review	5	0	100	5
Task 2: Developing Simulation Model for the Studied Network	30	0	100	30
Task 3: Design of Prototype Data Warehouse	10	0	100	10
Task 4: Evaluation of Selected ITS Strategies	35	0	100	35
Task 5 Final Report	10	0	60	6
Task 6 Extended Simulation Network	10	10	70	7
TOTAL	100 %			93.0 %

Project Objectives:

(1) Develop a microscopic traffic simulation model to evaluate the impact of potential ITS strategies for the studied network, and
(2) Design a prototype data warehouse model as a reliable data center for storing, processing, and analyzing transportation related data.

Project Abstract:

A traffic micro-simulation model will be developed to evaluate the anticipated traffic congestion due to upcoming construction in the area of NJ Route 139 and the impact of the construction on the Portway's Northern Extension. The boundaries for the network are to be determined, but may be roughly bounded by the following highways:

-NJ Route 3 to the north
-NJ Route 21 to the west
-NJ Turnpike Interchange 14 with US Routes 1&9 to the south
-NJ 440 and US 1 & 9 to the east

This network will be finely defined within the boundaries of the analysis area, but would only include the major routes and arterials outside of the analysis area. The simulation model will be set up in way as to allow for

future expansion, should further analysis be required on the outlining areas, such as the interchange between US 1&9 and NJ 3. As part of this proposal NJIT will work with the NJDOT as well as the area ITS Stakeholders group to test various traffic mitigation scenarios utilizing ITS simulated tools. The scenarios are: Traffic Signal Improvements, Promotion of Car/Van-pooling, Optimal Diversion of travelers to NJ Transit Hudson-Bergen Light Rail, PANYNJ's Path and NY Waterway and Yellow Taxi Ferry Systems, Variable Message Signs (to be used with Advanced Traffic Management Systems and Advanced Traveler Information Systems), Contra-flow lanes, etc. The use of TRANSMIT readers for traffic data is proposed.The NJIT team would co-ordinate with the NJDOT task member to select the different scenarios to be analyzed. Coordination meetings are proposed. The scenarios will be displayed as video clips suitable to be incorporated into PowerPoint presentations via AVI files.

The proposed work will be done in two phases. Phase I, encompassing Tasks 1 and 2, involves the NJ 139 simulation and will be done within the first four months from the date of award. Phase II, encompassing Tasks 3-5, will be completed in months 5 to 12 from the commencement of the project.

1.Progress this quarter by task:

Original Simulation Network Scope (RT 139): (99% Completed):
- A draft report summarizing the work completed under this task is being prepared.

Extended Simulation Network Scope (Additional Task): (85% Completed):
- Field visits were conducted to estimate traffic volumes in the Tonnele Circle Area.
- The base year simulation networks were calibrated for AM and PM peaks.
- RT139 Contract 3 Construction details (staging plans and estimated schedules) were requested (Feb 20, 09) from NJDOT Project Management (Larry Vogel) and received (received Feb 25, 09)
- St. Paul's Viaduct Construction details (staging plans and estimated schedules) were requested (Feb 27, 09) from NJDOT Project Management (Steve Hochman) and received (received Mar 16, 09)
- Wittpenn Bridge Construction details (staging plans and estimated schedules) have been requested (Feb 27, 09) from NJDOT Project Management (Bruce Riegel), but have not yet received.
- A meeting was held with NJ Turnpike staff (Mar 6, 09) to discuss this project and the upcoming construction work planned for the NJ Turnpike Extension. Details of the NJ Turnpike construction work has not yet been received.

Project Administration:
- A no-cost extension until June 30, 2009 has been requested, but has not yet been received by NJIT

2. Proposed activities for next quarter by task:

- Receive construction staging plans from NJDOT for Wittpenn Bridge Project
- Finalize the alternatives to be simulated in the model (based upon proposed schedules of construction lane closures or capacity reductions).
- Complete simulations of alternatives and present findings.
- Submit final report for project.

3. List of deliverables provided in this quarter by task (product date):

Presentation of developed simulation network and simulation of tested scenarios

4. Progress on implementation and training activities:

None

5. Problems/proposed solutions:

None

6. Budget summary:

Total Project Budget	$160,021.00
Modified Contract Amount	$199,015.00
Total Project Expenditure to date	$192,520.00
% of Total Project Budget Expended	96.74%

NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	**Customer Behavior Relative to Gap Between Platform and Train**
RFP Number:	**NJDOT Research Project Manager:** Vincent Nichnadowicz, NJDOT Project Manager
Task Order Number/Study Number: TO-81	**Principal Investigator:** Daniel, Janice R.
Project Starting Date: 1/1/2008 **Original Project Ending Date:** 3/31/2009 **Modified Completion Date:**	**Period Starting Date:** 1/01/2009 **Period Ending Date:** 3/31/2009

Task	% of Total Budget	Total Budget	% of Task this quarter	Cost this quarter	% of Task to date	Cost To Date
Develop research exit criteria	0.20	$271	0	$0	100	$271
Literature search	6.67	$9,041	5	$452	100	$9,041
Gather data and perform analysis	26.67	$36,163	5	$1,808	100	$36,163
Observe passengers	26.67	$36,163	5	$1,808	100	$36,163
Examine state of practice	6.47	$8,769	28.4	$2,490	53.35	$4,678
Make recommendations	16.67	$22,602	10	$2,260	85	$19,212
Prepare Quarterly Reports, a Tech Brief and a Final Report	16.67	$22,602	5	$1,130	71.86	$16,242
TOTAL	100 %	$135,610		$9,948		$121,770

Project Objectives:

The objectives of this research are:

1. Review the previous research and organize the information so the problem at NJT can be understood in context

2. Analyze accident data from NJT and compare it to other appropriate commuter rail properties

3. Observe customer behavior boarding and alighting trains and link behavior to risk of accidents

4. Identify approaches to mitigating accident risk using both “soft approaches” such as human factors, signage, and messages as well as “hard approaches” such as design issues

5. Make recommendations of appropriate factors to mitigate accidents in the context of implementation, cost and regulatory issues such as ADA.

Project Abstract:

The purpose of this research is to gain understanding of the factors associated with risk of gap injury incidents and identify potential ways to mitigate this problem. The research will examine accident data and classify incidents in terms of passenger characteristics and physical structure characteristics. We will calculate passenger injury rates and provide a range of ways to mitigate the problem in the context of risk factors associated with gap accidents.

1.Progress this quarter by task:

During this quarter the research team prepared the Draft Final Report and responded to comments received at the Quarterly Meeting (February, 2009) and from a meeting with NJ Transit (March, 2009). Information obtained from existing gap sizes on NJ Transit was incorporated into the report. Photos of the procedures used by NJ Transit to alert passengers to train gaps were also provided by NJ Transit and incorporated into the Draft Final Report.

2. Proposed activities for next quarter by task:

The research project is expected to end on March 31, 2009.

3. List of deliverables provided in this quarter by task (product date):

4. Progress on implementation and training activities:

5. Problems/proposed solutions:

6. Budget summary:

Total Project Budget	$135,610
Modified Contract Amount	$0.00
Funding Award to Date	$135,610
Total Project Expenditure to date	$121,770
% of Total Project Budget Expended	89.79 %
% of Total Project Completed	89.79 %

NJDOT Research Project Manager Concurrence: _____ **Date:** _____

NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	**Development of Weekend Travel Demand and Mode Split Models**
RFP Number: 2006-08	**NJDOT Research Project Manager:** Edward S. Kondrath
Task Order Number/Study Number: TO-63	**Principal Investigator:** Liu, Rachel
Project Starting Date: 1/1/2006 **Original Project Ending Date:** 12/31/2007 **Modified Completion Date:** 6/30/2009	**Period Starting Date:** 1/01/2009 **Period Ending Date:** 3/31/2009

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Review	5	20	100	5
Evaluate Existing Models in New Jersey	10	30	100	10
Survey State of Practice Outside of New Jersey	10	30	100	10
Prepare Interim Report	5	0	100	5
Develop Model Specifications	15	0	100	15
Demonstrate a Model Calibration	10	0	0	0
Monitor and Document	5	0	0	0
Develop Data	5	20	100	5
Calibrate Model	10	20	50	5
Develop Platform Model	10	20	20	2
Validate Model	5	0	0	0
Final Report	10	0	0	0
TOTAL	100 %			57.0 %

Project Objectives:

The purpose of this research is to specify an ultimate model that can be used to forecast weekend travel that incorporates the following processes: trip generation by trip type, time of day, origin-destination pattern, and mode choice. To derive the ultimate product of this project, the research team will undertake the following:

1. Examine the state of the art in model development for non-work, off-peak, and weekend travel;

2. Evaluate alternative multi-modal modeling approaches, explicitly considering the impacts of various factors such as congestion on mode shifts;

3. Research and evaluate available models and travel survey data at NJDOT, NJ TRANSIT and the local MPOs;

4. Identify data deficiencies and statistical validity of alternative approaches;

5. Develop requirements and standards for incorporating changes to accommodate weekend travel into existing model frameworks;

6. Recommend a course for the development of multi-modal weekend travel demand forecasting models suited to the needs of New Jersey;

7. Develop and calibrate new models, if permitted by available data, for incorporation into existing MPO, NJDOT and NJ TRANSIT model frameworks.

Project Abstract:

1.Progress this quarter by task:

Have completed the first two phase and progressing as planned in phase three.

2. Proposed activities for next quarter by task:

Process Data and
Estimate and calibrate pilot model

3. List of deliverables provided in this quarter by task (product date):

The deliverables to be developed as a part of the proposed research include the following items:

*Technical Memorandum for literature review;
*Technical Memorandum for evaluating existing models in New Jersey;
*Technical Memorandum for survey of state of practice;
*Interim Report;
*Technical Memorandum for model specifications;
*Technical Memorandum for model calibrations;
*Quarterly Progress Reports;
*Final Report.

4. Progress on implementation and training activities:

5. Problems/proposed solutions:

The Port Authority auto data was received in the middle of September, which is 6 months behind the schedule but the project team will try our best to expedite the process. the PI will communicate with PM on potnetial solutions.

6. Budget summary:

Total Project Budget	$254,621.00
Modified Contract Amount	$354,568.00
Total Project Expenditure to date	$216,012.00
% of Total Project Budget Expended	60.92%

NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	**Non-Contact Skid Resistance Measurement**
RFP Number: 2000-08	**NJDOT Research Project Manager:** Vincent Nichnadowicz
Task Order Number/Study Number: TO-80	**Principal Investigator:** Meegoda, Jay N.
Project Starting Date: 1/1/2008 **Original Project Ending Date:** 12/31/2009 **Modified Completion Date:**	**Period Starting Date:** 1/01/2009 **Period Ending Date:** 3/31/2009

Task	% of Total Budget	Total Budget	% of Task this quarter	Cost this quarter	% of Task to date	Cost To Date
Literature Search and Review	10	$14,323	0	$0	100	$14,323
Selection of a Non Contact Method to measure Surface	15	$126,485	0	$0	100	$126,485
Field Evaluation of Surface Texture	15	$21,485	10	$1,749	100	$21,485
Correlate surface texture from non laser with traditional methods	25	$35,808	5	$1,790	5	$1,790
Develop the standard Materials Procedure (MP)	10	$14,323	5	$716	5	$716
Integration of Texture Data into Pavement Management System	15	$21,485	5	$1,074	5	$1,074
Quarterly Progress and Final Reports	10	$14,323	0	$0	0	$0
TOTAL	100 %	$248,230		$5,330		$165,873

Project Objectives:

The objectives of this study are:

1 Develop a vehicle-mounted screening device to measure variations in pavement texture using a non-contact high-speed method.

2 Correlate that with CT Meter test procedure presented in ASTM E2157 to validate macro-texture measurements.

3 Recommend development of NJDOT specification for implementation of the surface texture measurement methods.

Project Abstract:

Pavement texture is the controlling factor in the skid-resistance level of roadway surfaces. Through a complex interaction of micro and macro textures at the pavement-tire interface, sufficient friction is needed for vehicles to perform routine maneuvers under normal operating conditions. To obtain more complete data on texture, a non-contact high-speed method was developed to permit the collection of pavement data from a vehicle moving at highway speeds. This method can be correlated with CT Meter test procedure presented

in ASTM E2157 to validate macro-texture measurements. These methods combine existing designs for the measurement of macro-texture. This research will develop a correlation of macro-texture measurements with skid resistance values to allow the Department to estimate skid values of the pavement network while collecting pavement ride quality data for the PMS with one piece of equipment on an annual basis. This will significantly reduce the need for the ASTM E 274 skid resistance trailer to collect the skid resistance data. The screening of the state's pavement network would allow detailed measurement of the pavement-tire interface with ASTM E 274 skid resistance trailer.

1.Progress this quarter by task:

The progress of the project to date is approximately 42.5%
Phase I-Literature Search and Review completed and submitted a report
Phase II Task 1 - Selection of a Non Contact Method to measure Surface completed and ordered all equipment
Phase II Task 2 - Field Evaluation of Surface Texture from a Non Contact Method completed
Phase II Task 3 -Correlate surface texture from non laser with traditional methods 5% completed
Phase II Task 4 -Develop the standard Materials Procedure (MP) 5% completed
Phase II Task 5 -Integration of Texture Data into Pavement Management System 5% completed

2. Proposed activities for next quarter by task:

Phase II Task 3 -Correlate surface texture from non laser with traditional methods
Phase II Task 4 -Develop the standard Materials Procedure (MP)
Phase II Task 5 -Integration of Texture Data into Pavement Management System

3. List of deliverables provided in this quarter by task (product date):

None

4. Progress on implementation and training activities:

None

5. Problems/proposed solutions:

None

6. Budget summary:

Total Project Budget	$248,230
Modified Contract Amount	$0.00
Funding Award to Date	$170,538
Total Project Expenditure to date	$160,564
% of Total Project Budget Expended	64.68 %
% of Total Project Completed	42.50 %

NJDOT Research Project Manager Concurrence: _____ **Date:** _____

NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	**Development of New Jersey Rates for NJCMS Incident Delay Model**
RFP Number: 2005-02	**NJDOT Research Project Manager:** Robert Sasor
Task Order Number/Study Number: TO-66	**Principal Investigator:** Chien, Steven I-Jy
Project Starting Date: 1/1/2006 **Original Project Ending Date:** 12/31/2006 **Modified Completion Date:** 9/30/2007	**Period Starting Date:** 1/01/2009 **Period Ending Date:** 3/31/2009

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	5	0	100	5
Review the Current Practice of NJCMS	5	0	100	5
Comprehensive Literature Search	5	0	100	5
Technology Transfer	5	0	100	5
Develop NJCMS Incident Database	35	0	100	35
Development of Robust Models for Incident Rates and Durations	10	0	100	10
Develop a Procedure to Maintain the Database	5	0	100	5
Determine Reasonably Accurate Incident Rates and Duration Estimates	15	0	100	15
Feasibility and Cost/Benefit Analysis	5	0	100	5
Final Report	10	0	100	10
TOTAL	100 %			100 %

Project Objectives:

- Determine if and how existing incident reports and databases can be used to generate good, New Jersey specific estimates of incident rates, response times, and clearance times for both peak and off-peak periods.
- Determine if new data in the form of actual field observations of incidents (from the beginning to the end of an incident) will be reasonable and useful to supplement and tie together the existing data.
- Develop an up-to-date incident database to store the information required and generate reasonably accurate estimates of inputs required by the NJCMS model.
- Conduct a cost and benefit analysis of various methods and technologies to collect continuous incident related data for the database developed in this project.

Project Abstract:

The Congestion Management System used by the New Jersey Department of

Transportation (NJCMS) contains a model that estimates the non-recurring delay that occurs from incidents on highways. The NJCMS model uses rates for incident types that were determined from national studies. To make better predictions of non-recurring delay for New Jersey highways, NJ specific rates are needed. These incident rates should be developed for the nine categories of incidents for peak and off-peak periods (fatal, personal injury, property damage, mechanical/electrical, stall, flat tire, abandoned, debris, other). In addition, percent blockage of lanes and shoulders, percent capacity remaining, response time, and clearance times need to be determined for incidents. While various incident reports exist such as police reports, and various Traffic Operations reports, they do not provide data for the NJCMS model.

A feasibility study is required to determine if and how police reports, Traffic Operations databases, Emergency Service Patrol records, and other existing incident data can be utilized to provide estimates of the input parameters needed for the NJCMS non-recurring delay model. This study would decide if new data in the form of actual field observations of incidents (from beginning to end) would be reasonable and useful to supplement and tie together the existing data. If so, the feasibility and cost effectiveness of various methods and technologies to collect this continuous incident observation data would be examined.

1.Progress this quarter by task:

- Wait for comments to revise the final report

2. Proposed activities for next quarter by task:

3. List of deliverables provided in this quarter by task (product date):

- Revised accident rates tables.
- Revides incident rates tables based on the data collected on routes with ESP services.
- presentation of calculation of accident and incident rates.
- presentation of clearance and response times calculation.
- final report

4. Progress on implementation and training activities:

None.

5. Problems/proposed solutions:

None.

6. Budget summary:

Total Project Budget	$198,993.00
Modified Contract Amount	
Total Project Expenditure to date	$197,730.00
% of Total Project Budget Expended	99.37%

NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	**Culvert Information Management System, Phase II (GIS Interface)**
RFP Number:	**NJDOT Research Project Manager:** Mr. Robert Sasor
Task Order Number/Study Number: TO-85	**Principal Investigator:** Meegoda, Jay N.
Project Starting Date: 08/15/2008 **Original Project Ending Date:** 06/15/2009 **Modified Completion Date:** 08/15/2009	**Period Starting Date:** 1/01/2009 **Period Ending Date:** 3/31/2009

Task	% of Total Budget	Total Budget	% of Task this quarter	Cost this quarter	% of Task to date	Cost To Date
Task 1.1-Data upload from DVD	25.00	$12,500	40	$5,000	40	$5,000
Task 1.2-Customization of CIMS Reporting	20.00	$10,000	5	$500	5	$500
Task 1.3-Develop new spec and data disk for inspection. Develop data translation program.	20.00	$10,000	10	$1,000	10	$1,000
Task 1.4-Complete survey of VHS Tapes and cost & time estimate	20.00	$10,000	15	$1,500	15	$1,500
Task 1.5-Prepare quarterly progress reports and final report	15.00	$7,500	0	$0	0	$0
					0	
TOTAL	100 %	$50,000		$8,000		$8,000

Project Objectives:

The objectives of Phase II of this research/demonstration project are:

1.Upload all inspection data on DVDs to make CIMS current and update the SLD database

2.Customize CIMS to generate quarterly reports to NJDOT upper management

3.Develop a data translation program to populate the CIMS for COBRA and other inspection systems.

4.Conduct a reconnaissance of the culvert data provided for all the old inspection contracts and provide a cost and time estimate to update and upload that data to CIMS.

Project Abstract:

The overall objective of this research is to enhance the pilot scale Culvert Information Management System (CIMS) by adding data and improving the functionality. It is proposed to add all the data on DVD's from recent culvert inspections to CIMS database and to update the NJDOT straight-line diagram (SLD) database with this data. It is also proposed to conduct a survey of the VHS tapes from all the old inspection contracts and to provide an estimate to update and upload that data to the CIMS. In addition it is

NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	**Culvert Information Management System, Phase II (GIS Interface)**
RFP Number:	**NJDOT Research Project Manager:** Mr. Robert Sasor
Task Order Number/Study Number: TO-85	**Principal Investigator:** Meegoda, Jay N.
Project Starting Date: 08/15/2008 **Original Project Ending Date:** 06/15/2009 **Modified Completion Date:** 08/15/2009	**Period Starting Date:** 1/01/2009 **Period Ending Date:** 3/31/2009

Task	% of Total Budget	Total Budget	% of Task this quarter	Cost this quarter	% of Task to date	Cost To Date
Task 1.1-Data upload from DVD	25.00	$12,500	40	$5,000	40	$5,000
Task 1.2-Customization of CIMS Reporting	20.00	$10,000	5	$500	5	$500
Task 1.3-Develop new spec and data disk for inspection. Develop data translation program.	20.00	$10,000	10	$1,000	10	$1,000
Task 1.4-Complete survey of VHS Tapes and cost & time estimate	20.00	$10,000	15	$1,500	15	$1,500
Task 1.5-Prepare quarterly progress reports and final report	15.00	$7,500	0	$0	0	$0
					0	
TOTAL	100 %	$50,000		$8,000		$8,000

Project Objectives:

The objectives of Phase II of this research/demonstration project are:

1.Upload all inspection data on DVDs to make CIMS current and update the SLD database

2.Customize CIMS to generate quarterly reports to NJDOT upper management

3.Develop a data translation program to populate the CIMS for COBRA and other inspection systems.

4.Conduct a reconnaissance of the culvert data provided for all the old inspection contracts and provide a cost and time estimate to update and upload that data to CIMS.

Project Abstract:

The overall objective of this research is to enhance the pilot scale Culvert Information Management System (CIMS) by adding data and improving the functionality. It is proposed to add all the data on DVD's from recent culvert inspections to CIMS database and to update the NJDOT straight-line diagram (SLD) database with this data. It is also proposed to conduct a survey of the VHS tapes from all the old inspection contracts and to provide an estimate to update and upload that data to the CIMS. In addition it is

NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	**Culvert Information Management System, Phase II**
RFP Number:	**NJDOT Research Project Manager:** Mr. Robert Sasor
Task Order Number/Study Number: TO-85	**Principal Investigator:** Meegoda, Jay N.
Project Starting Date: 08/15/2008 **Original Project Ending Date:** 06/30/2009 **Modified Completion Date:** 08/15/2009	**Period Starting Date:** 1/01/2009 **Period Ending Date:** 3/31/2009

Task	% of Total Budget	Total Budget	% of Task this quarter	Cost this quarter	% of Task to date	Cost To Date
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4.Conduct a reconnaissance of the culvert data provided for all the old inspection contracts and provide a cost and time estimate to update and upload that data to CIMS.

Project Abstract:

The overall objective of this research is to enhance the pilot scale Culvert Information Management System (CIMS) by adding data and improving the Functionality. The culvert inspection data on DVDs will be added to CIMS database and to update the NJDOT straight-line diagram (SLD) database. Then we will conduct a survey of the VHS tapes from all the old inspection contracts and provide a time and effort estimate to update and upload that

data to the CIMS. In addition we will improve the functionality of the CIMS to include the ability to generate reports to NJDOT upper management, and also to improve its ability to be used by all the potential culvert inspection contractors.

The CIMS will comply with both requirements stipulated by the Governmental Accounting Standards Board (GASB-34) and the new federal storm water regulations. The CIMS will serve as a vehicle for evaluating underground infrastructure assets, specifically culverts, and facilitate computing present worth, as well as, comparing the present costs of preserving them. Benefits of the CIMS will include long-term savings that should accrue from adopting optimized preventive maintenance strategies. The CIMS consists of three major computer software components: databases, user interfaces, and a data administration module. Secondary components include an inlet/outlet structures module and a culvert segments module. The inlet/outlet structures module stores all the storm water data such as the quality/quantity of water and the receiving and discharge watersheds. Users will be able to retrieve culvert and inlet/outlet information and generate reports via location and road/milepost for condition state and assets needing immediate repair.

1.Progress this quarter by task:

The progress of the project to date is approximately 16%
Task 1.1-Data upload from DVD 40% completed
Task 1.2-Customization of CIMS Reporting 5% completed
Task 1.3-Develop new spec and data disk for inspection. Develop data translation program. 10% completed
Task 1.4-Complete survey of VHS Tapes and cost & time estimate 15% completed

2. Proposed activities for next quarter by task:

The following Tasks will be attempted
Task 1.1-Data upload from DVD
Task 1.2-Customization of CIMS Reporting
Task 1.3-Develop new spec and data disk for inspection. Develop data translation program.
Task 1.4-Complete survey of VHS Tapes and cost & time estimate

3. List of deliverables provided in this quarter by task (product date):

None

4. Progress on implementation and training activities:

None.

5. Problems/proposed solutions:

None.

6. Budget summary:

Total Project Budget	$50,000
Modified Contract Amount	$0.00
Funding Award to Date	$50,000
Total Project Expenditure to date	$9,208
% of Total Project Budget Expended	18.42 %
% of Total Project Completed	16.00 %

NJDOT Research Project Manager Concurrence: _____ **Date:** _____

NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	**Railroad Crossing Safety**
RFP NUMBER: **2009-06**	NJDOT RESEARCH PROJECT MANAGER: **Edward Kondrath**
TASK ORDER NUMBER: **87**	PRINCIPAL INVESTIGATOR: **Rongfang (Rachel) Liu**
Project Starting Date: January 1, 2009 **Original** Project Ending Date: June 30, 2010 **Modified Completion Date:**	Period Starting Date: 1/1/2009 Period Ending Date: 3/31/2009

Tasks	**% of Total**	**% of Task this quarter**	**% of Task to Date**	**% of Total complete**
1. Review Literature	11%	100%	100%	11%
2. Survey Peer State DOTs	17%	10%	10%	2%
3. Establish New Jersey Baseline	6%	0	0	0%
4. Develop solutions	39%	0	0	0%
5. Demonstrate recommended solutions	11%	0	0	0%
6. Assist in Grant Applications	6%	0	0	0%
5. Draft Final Report.	6%	0	0	0%
6. Final Report.	6%	0	0	0%
Total:	100%			13%

Project Objectives:

NJDOT is interested in improving motorist safety at all railroad crossings through an optimal approach to identify vegetation blockage of the sight distances at the highway-railroad crossings. The project team will work with the railroad engineers to explore solutions in identifying potential hazards at various locations and select the best innovative approach for corrective action. In order to produce a practical, implementable solution, the following objectives will be addressed:

1. Review existing literature to identify potential solutions or best practices implemented by other entities so we don't have to re-invent the wheel unless it is absolutely necessary.

2. Survey peers among state DOTs, railroad associations, and other related parties to acquire existing practices and potential solutions in the developing stages

3. Evaluate current operations of the Railroad Engineering and Safety Division in NJDOT to establish the baseline for implementing potential solutions.

4. Coordinate with NJDOT staff and Research Project Selection and Implementation Panel (RPSIP) to select the optimal approach among various potential solutions to identify vegetation blockage of the clearance triangle at railroad crossings.

5. Demonstrate the practicality and implementability of the recommended solution by applying the process to selected locations.

6. Identify potential grant or financial resources and assist NJDOT in developing the grant applications if necessary.

Project Abstract:

Progress this quarter by task:

Dr. Liu, the project PI, has delivered the Technical Memorandum I: Literature Review to Mr. Konrath, the NJDOT PM. The Tech Memo documented the results the literature review effort performed under the Task 1 scope, particularly related to safety sight distance and vegetation clearances.

Proposed activities for next quarter by task:

On schedule, the research team will proceed to the Task 2 and 3 simultaneously to survey peer state DOTs and establish New Jersey Baseline in terms of railroad crossing information. The research team has contacted FRA, various state DOTS and Association of America Railroad (AAR) to gather contact information for potential survey candidates. The research team will develop a draft survey instrument in the next few weeks and forward it the NJDOT Railroad Engineers for comments and revision. The research team will carry out the survey during the summer once the final survey instrument is approved

List of deliverables provided in this quarter by task (product date)

Technical Memorandum I: Literature Review on

Progress on Implementation and Training Activities:

Progress as planned.

Problems/Proposed Solutions: None.

Total Project Budget	$149,463
Modified Contract Amount:	
Total Project Expenditure to date	16,562
% of Total Project Budget Expended	11%